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Patentanmeldung Nr. Patent application No. Demande de brevet n°

00204165.5

Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office
Le Président de l'Office européen des brevets
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LA HAYE, LE



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**Blatt 2 der Bescheinigung
Sheet 2 of the certificate
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A combined set comprising a remote control and a first electronic device

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(74)

The invention relates to a combined set comprising a remote control and at least a first electronic device, wherein said remote control comprises a first memory provided for storing a set of code data for operating a further electronic device, said first memory being connected to an input of a signal generator for supplying said code data, which signal generator is provided for generating, based on said code data, operating signals for operating said further electronic device and for transmitting said operating signals to said further electronic device, said first electronic device comprising a data input provided to receive data from said remote control

Such combined sets are generally known from audio and video apparatuses. In the known combined sets, the remote control comprises a first memory which is loaded with code data retrieved for example from a smart card. Once the code data is retrieved from the smart card and stored into the first memory, the smart card can be thrown away. For the operation of the further electronic device, the user presses or touches a key of the remote control which causes the code data assigned to the selected key to be retrieved from the first memory. The retrieved code data is forwarded to the signal generator where an operating signal is generated based on the retrieved code data. The generated signal is then transmitted to the electronic device to operate the latter.

A drawback of the known combined set is that the generation of a back-up of the code data is rather cumbersome. The user who wants to build up a back-up version of the code date is obliged to retrieve them one by one from the first memory by each time pressing or touching the assigned key. Such an operation is time consuming and there is a fair chance that the user will omit to press certain keys, thus causing only a partial back-up. Moreover, it is the operating signal and not the code data as such that is transmitted.

It is an object of the present invention to provide the user a more user-friendly way to build up a back-up version of the code data.

A combined set according to the invention is characterized in that said remote control comprises a code data output unit connected with said first memory, said code data output unit having a further input for receiving an upload signal and being provided for reading, under control of said upload signal, at least a subset of said set of code data from

said memory, said code data output unit being provided for burstwise transmitting said subset towards said data input of said first electronic device which comprises a second memory for storing a received subset. By providing a code data output unit in the remote control and a second memory in the first electronic device, the code data as such can be retrieved from the
5 first memory and transmitted as code data towards the second memory where they can be stored. In such a manner, at least a second subset of the code data is not only available in the first memory but also in the second memory which belongs to the first electronic device. So when the code data in the remote control is lost, for example due to a battery failure, the code data can be downloaded from the second memory and there is no need to buy a new smart
10 card. Moreover, by sending the code data subset burstwise towards the first electronic device, it is no longer necessary to send and retrieve them by pressing key by key on the remote control.

A first preferred embodiment of a combined set according to the invention is characterized in that said signal generator is connected to said code data output unit which is
15 provided for generating a control signal after reading said subset and transmitting said control signal and said subset to said signal generator, said signal generator being provided for generating a code data signal comprising said subset upon receipt of said control signal and transmitting said code data signal to said data input of the first electronic device which is provided with a signal decoder provided for retrieving said subset from a received code data
20 signal. In such a manner the transmission of the subset to the second memory is realized by using the signal generator without affecting the transmission of the operating signals or the operation of the further electronic device.

A second preferred embodiment of a combined set according to the invention is characterized in that said first electronic device comprises a verification unit connected to
25 said data input, said verification unit being provided for comparing a received subset with subsets stored in said second memory and for generating a first flag if said received subset is not already stored in said second memory. The presence of a verification unit enables to verify whether the newly supplied subset has already been received by the first electronic device.

30 A third preferred embodiment of a combined set according to the invention is characterized in that said verification unit is provided for generating a second flag if said received subset is already stored in said second memory, said verification unit being further provided for disabling, under control of said second flag, a writing operation into said second

memory. In such a manner, only that subset which is not yet stored into the second memory will be stored.

Preferably, said signal generator is provided to generate said operating signal according to a predetermined transmission protocol, said code data output unit being provided for including an identifier, identifying said transmission protocol into said subset. When a universal remote control is used, the identifier enables to add the protocol to the code data and to furnish the protocol upon loading a subset retrieved from the second memory.

The invention also relates to a remote control as part of said combined set.

Preferably said remote control is a user-configurable remote control. As user-configurable remote controls have a volatile memory, the present invention offers a suitable solution to load or update them directly from the first electronic device without use of a smart card.

The invention will now be described in more details with respect to the drawings in which a preferred embodiment of a communication system according to the invention is shown. In the drawings :

Figure 1 and 2 illustrate schematically a system according to the invention; Figure 3 respectively 4 illustrate schematically an electronic circuit of the remote control respectively the first electronic device;

Figure 5 shows a flow chart illustrating the operation of the remote control when code data has to be transmitted; and

Figure 6 shows a flow chart illustrating the operation of the first device upon receipt of a code data signal.

In the drawings, a same reference sign has been assigned to a same or analogous element.

The combined set illustrated in Figure 1 comprises a remote control 1 and at least one further electronic device 2, 3, 4 and 5. The number of electronic devices, shown in Figure 1, is of course arbitrary and the set could comprise more or less devices than the four illustrated. The devices are for example formed by a television receiver 2, a video 3, an audio amplifier 4 and a first electronic device 5 for example formed by a set-up box. The remote control is provided to send operating signals to the devices 2, 3 and 4 and to communicate with the first electronic device 5.

The remote control 1 comprises several command keys 8, 9 and 10, which are either formed by resilient push buttons or by soft keys, displayed on a display screen.

Activation of one of the keys initiates the generation of an operating signal, which is

The remote control could be a user-configurable remote control which can be loaded either by a smart card or by other means such as direct connection with a database. It will however be clear that the present invention is not limited to a user-configurable remote control.

5 As illustrated in Figure 2, the first electronic device 5 comprises a data input 20 provided to receive data from the remote control. The further device 3, comprises a control signal input 23 for receiving operating signals from the remote control. For this purpose the remote control 1 is provided with a transmitter 15. The remote control is further provided with a code data output unit 21 and with a first memory 13 connected with a data processing unit 12.

10 Figure 3 illustrates, in the form of a block diagram and schematically, the electronic circuit of the remote control 1. The latter comprises a communication bus 11, to which the data processing unit 12, for example a microprocessor, is connected. The first memory 13 and a key module 16 as well as an interface 14 are also connected to the bus 11.
15 The key module 16 forms the interface between the command keys 8, 9 and 10 and the processing unit 12 and converts the actuation of a key into an instruction to be processed by the data processing unit. The first memory 13 is provided for storing a set of code data for operating at least one further electronic device (2, 3, 4). The interface 14 is further connected with a second communication unit 15, preferably an infrared transmitter, provided for
20 transmitting signals towards the devices, and with the code data output unit 21.

25 Upon activation of one of the keys by a user for example key 8-1 "Volume up", an instruction, identifying the activated key, is sent by the key module 16 towards the data processing unit. On the basis of that instruction, the data processing unit generates an address in order to address and read in the first memory 13 the code data assigned to the activated key. That addressed code data is then forwarded to the interface 14, which comprises a signal generator provided for generating, based on the supplied code data, an operating signal for operating one of the further devices. The operating signal is sent to the further device by means of the transmitter 15.

Indeed, each of the further devices is provided to detect an operating signal emitted by the remote control. The operating signal is therefore usually modulated according to a predetermined transmission protocol on a carrier wave to which the device is triggered. The signal generator will modulate the code data on the carrier wave according to the one of the device for which the signal is meant. The signal is also modulated according to the protocol of the addressed device. If the remote control is an user-configurable universal

remote control, it is necessary to supply to the signal generator the necessary data, including the transmission protocol and the carrier wave frequency, in order to generate an operating signal that can be received and decoded by the addressed device. Therefor, it is not only important to store the code data assigned to each of the keys, for example increase the sound volume of the television receiver, but also the carrier frequency and the modulation protocol. Instead of using a carrier frequency, the operating signal could be formed by a series of pulses wherein either the number or the length of the pulses determine the contents of the operating signal.

Figure 4 illustrates, in the form of a block diagram and schematically, the electronic circuit of the first electronic device 5. That first electronic device comprises a communication bus 17 to which a data processing unit 24 and a second memory 18 are connected. An interface 19 is also connected to bus 17. The data input 20 is connected to the interface 19. This data input 20 is provided to receive code data from the remote control 1. It should be noted, that the first electronic device could also be formed by a usual PC in connection with the Internet or by a television or audio receiver connected to a Cable Antenna TV (CATV). In the latter cases, the second memory 18 is formed by the RAM of the PC or by a buffer capable of storing, at least temporarily, data downloaded from the Internet or from the CATV supplier. It is not necessary that the data input 20 and the second memory are physically connected to a same bus 17. They could be remote from each other. It is however important that they can communicate with each other.

The second memory 18 of the first electronic device 5 is provided for storing code data originating from the first memory 13 of the remote control 1. In order to transfer the code data assigned to each of the command keys, the remote control has to be switched in an upload mode. For this purpose the user for example presses key 22 on the remote 1. Alternatively the user could press another key, for example the volume up key, twice or three times or presses two keys successively depending on how the remote is constructed. By pressing (KY) the appropriate key or keys an upload signal is generated (ULS) as illustrated schematically in the flow chart shown in Figure 5. The different instructions illustrated in this flow chart are executed under control of the data processing unit 12.

The upload signal is supplied to the code data output unit 21 for activating the latter and the data processing unit requests (AC) the user if all code data has to be read from the first memory. This is for example realized either by displaying a message on a display of the remote, if provided, or by lighting up keys. When the user indicates that not all the code

processing unit requests the user (IND G) to indicate which second subset should be selected. So for example the user could request that only the code data for operating the VCR should be selected. The user then indicates (GSA) which subset should be selected, for example by pressing on the key associated to the selected device.

5 Once the user has indicated which code data should be selected, the code data output unit receives the user's instructions, i.e. either all code data or only a selected subset, and starts to generate (GA) the addresses of the first memory locations where the selected code data are stored. The generated addresses are then supplied to the first memory in order to read and retrieve (RDA) the code data stored at the addressed memory locations.

10 Depending on the configuration of remote control and the first electronic device the read code data is then configured into a transmittable message (CTM). In case for example, that the remote control and the first electronic device are connectable by means of a wire, the code data is digitally transferred in a manner comparable with the one in which data is transmitted in a computer network. If on the other hand the code data is transmitted by
15 means of an infra-red or ultrasonic signal, the code data is modulated as a series of pulses which are however different from those used to transfer an operating signal in order to not disturb the operation of the other electronic devices. The signal generator could be used for transmitting the code data. However in the latter case the signal generator is switched in a mode suitable to transmit such code for example by means of a control signal generated by
20 the code data output unit.

If the signal generator is provided to generate operating signals according to a predetermined transmission protocol, for example RC 5 for Philips device, that protocol could also be included in the data transmitted to the first device. In the latter case the code data output unit is provided to generate an identifier, identifying that protocol and to include
25 (INT) that identifier into the second subset of code data to be transmitted. This is in particular the case if a learnable or user-configurable remote control is used and which is used to operate several electronic devices of different manufacturers. For each device the transmission protocol has to be identified and entered into the learnable remote.

Once the message including the code data, whether or not with the identifier,
30 that code data signal is transmitted (TCM) to the first device.

The code data is burstwise transmitted to the first electronic device either as a batch including all the code data to be transferred or as a series of successive signals. Once the code data, eventually with the identifier, are received by the first electronic unit, the latter can be stored in the second memory 18. The data input is preferably provided, if used to

receive the code data signal, of a signal decoder provided to retrieve the subset, and the identifier if present, from the received code data signal. The retrieved code data is then stored in the second memory at successive addresses generated by an address generator of the first electronic device.

5 The first device is preferably provided with a verification unit which is part of the data processing unit 24. The verification unit is provided for comparing received code data with the one stored in the second memory in order to avoid that a same code data would be stored twice. For this purpose, the verification unit is connected with the second memory and the interface 19, where the code data signal is input.

10 Upon receipt (RC, see Figure 6) of a code data signal by the interface, the verification unit reads (RD) the stored code data and compares (COM) that received code data with the one stored into the second memory. If that received code data was already, respectively, is not yet present into the second memory, the verification unit generates a second (2F) respectively a first (1F) flag. Under control of the first flag, the received code
15 data is stored (S) into the second memory, whereas under control of the second flag, the received code data is ignored (OV) and the access to the second memory is disabled.

If the verification unit establishes that the code data is already stored, it could also verify if the received code data is not an updated version of the stored one, and in the latter case, replace the stored one with the updated one. In such a manner, an updated
20 contents of the second memory is maintained. The user who then reloads his first memory, will always have an updated contents.

The present invention not only provides the possibility to load or reload the first memory, but also, if the code data are available on a common source such as a CATV supplier or an Internet provider, to complete or update the first memory of his remote control.

25 When the user now needs either to update his remote control or to reload the first memory of his remote control, for example because the contents has been lost due to a battery failure, he can download them from the second memory. For this purpose, the user activates his remote control by pressing a call key associated with the first device. This causes a calling signal to be generated and transmitted to the first electronic device. Upon
30 receipt of such a calling signal, the first electronic device will start to address the second memory or download the code data from the second memory. The different code data, depending on the configuration of the remote control, will be transmitted then towards the remote control, where they can be stored into the first memory. For this purpose, either the transmitters/receivers 15 and 20 or the wired connection, if available, are used.

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ABSTRACT:

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A combined set comprising a remote control and at least a first electronic device, wherein said remote control comprises a first memory provided for storing a set of code data for operating a further electronic device, said first memory being connected to an input of a signal generator for supplying said code data, which signal generator is provided for generating, based on said code data, operating signals for operating said further electronic device and for transmitting said operating signals to said further electronic device, said first electronic device comprising a data input provided to receive data from said remote control, said remote control comprises a code data output unit connected with said first memory, said code data output unit having a further input for receiving an upload signal and being provided for reading, under control of said upload signal, at least a subset of said set of code data from said memory, said code data output unit being provided for burstwise transmitting said subset towards said data input of said first electronic device which comprises a second memory for storing a received subset.

15 Fig. 1

CLAIMS:

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(74)

1. A combined set comprising a remote control and at least a first electronic device, wherein said remote control comprises a first memory provided for storing a set of code data for operating a further electronic device, said first memory being connected to an input of a signal generator for supplying said code data, which signal generator is provided for generating, based on said code data, operating signals for operating said further electronic device and for transmitting said operating signals to said further electronic device, said first electronic device comprising a data input provided to receive data from said remote control, characterized in that said remote control comprises a code data output unit connected with said first memory, said code data output unit having a further input for receiving an upload signal and being provided for reading, under control of said upload signal, at least a subset of said set of code data from said memory, said code data output unit being provided for burstwise transmitting said subset towards a further data input of a second electronic device which comprises a second memory for storing a received subset.
- 15 2. A combined set as claimed in claim 1, characterized in that said signal generator is connected to said code data output unit which is provided for generating a control signal after reading said subset and transmitting said control signal and said subset to said signal generator, said signal generator being provided for generating a code data signal comprising said subset upon receipt of said control signal and transmitting said code data signal to said further data input of the second electronic device which is provided with a signal decoder provided for retrieving said subset from a received code data signal.
- 25 3. A combined set as claimed in claim 1 or 2, characterized in that said second electronic device comprises a verification unit connected to said second memory and said further data input, said verification unit being provided for comparing a received subset with subsets stored in said second memory and for generating a first flag, if said received subset is not already stored in said second memory.

4. A combined set as claimed in claim 3, characterized in that said verification unit is provided for generating a second flag if said received subset is already stored in said second memory, said verification unit being further provided for disabling, under control of said second flag, a writing operation into said second memory.

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5. A combined set as claimed in anyone of the claims 1 to 4, characterized in that said signal generator is provided to generate said operating signal according to a predetermined transmission protocol, said code data output unit being provided for including an identifier, identifying said transmission protocol into said subset.

10

6. A combined set as claimed in anyone of the claims 1 to 5, characterized in that the first and second electronic device are the same.

7. A remote control as part of a combined set according to anyone of the claims

15 1-6, wherein said remote control comprises a first memory provided for storing a set of code data for operating a first electronic device, said first memory being connected to an input of a signal generator for supplying said code data, which signal generator is provided for generating, based on said code data, operating signals for operating said first electronic device and for transmitting said operating signals to said first electronic device, said first
20 electronic device comprising a data input provided to receive data from said remote control, characterized in that said remote control comprises a code data output unit connected with said first memory, said code data output unit having a further input for receiving an upload signal and being provided for reading, under control of said upload signal, at least a subset of said set of code data from said memory, said code data output unit being provided for burstwise transmitting said subset towards a further data input of a second electronic device
25 which comprises a second memory for storing a received subset.

8. A remote control as claimed in claim 7, characterized in that it is a user-configurable remote control.

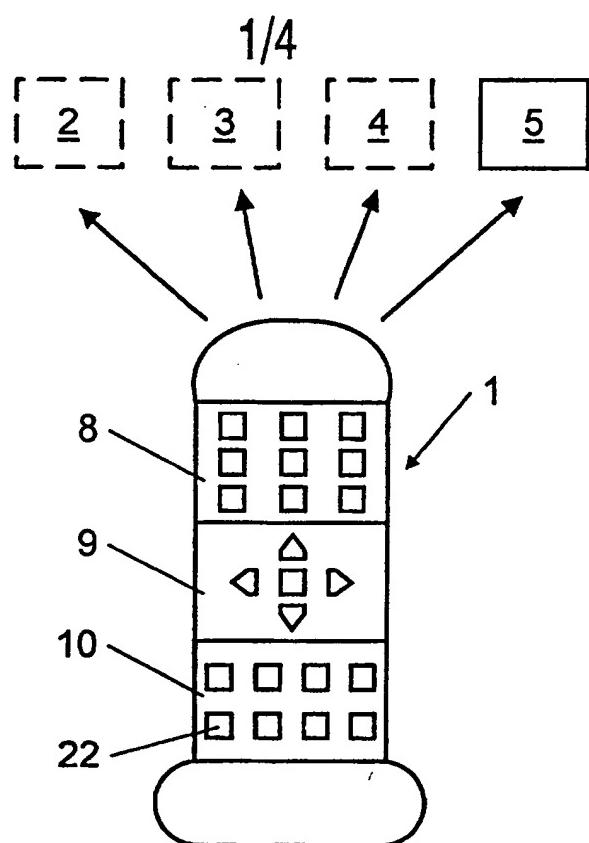


FIG. 1

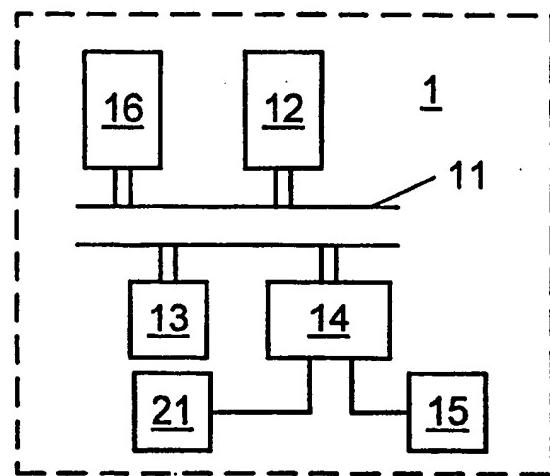


FIG. 3

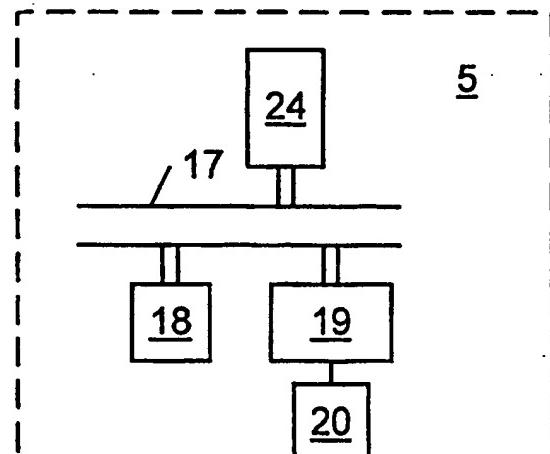


FIG. 4

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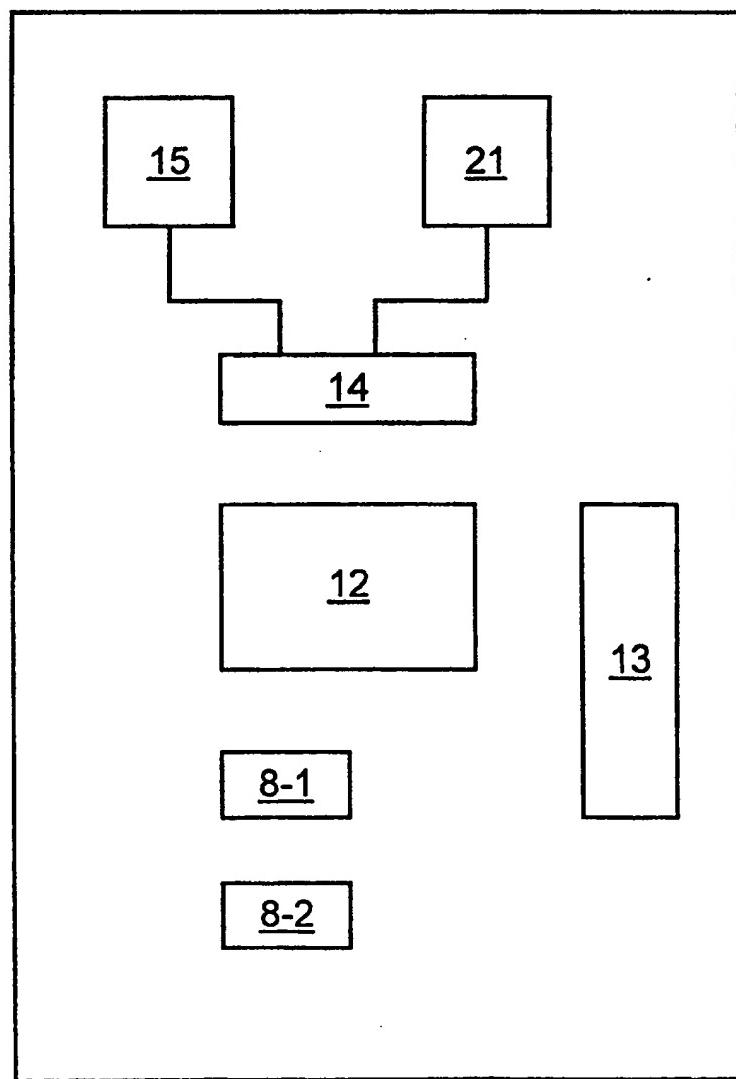
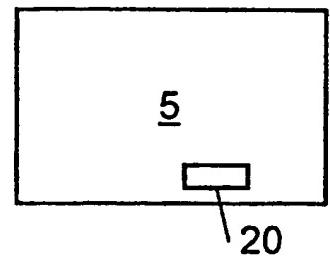
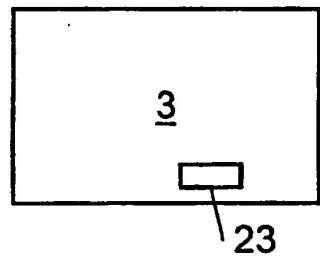


FIG. 2

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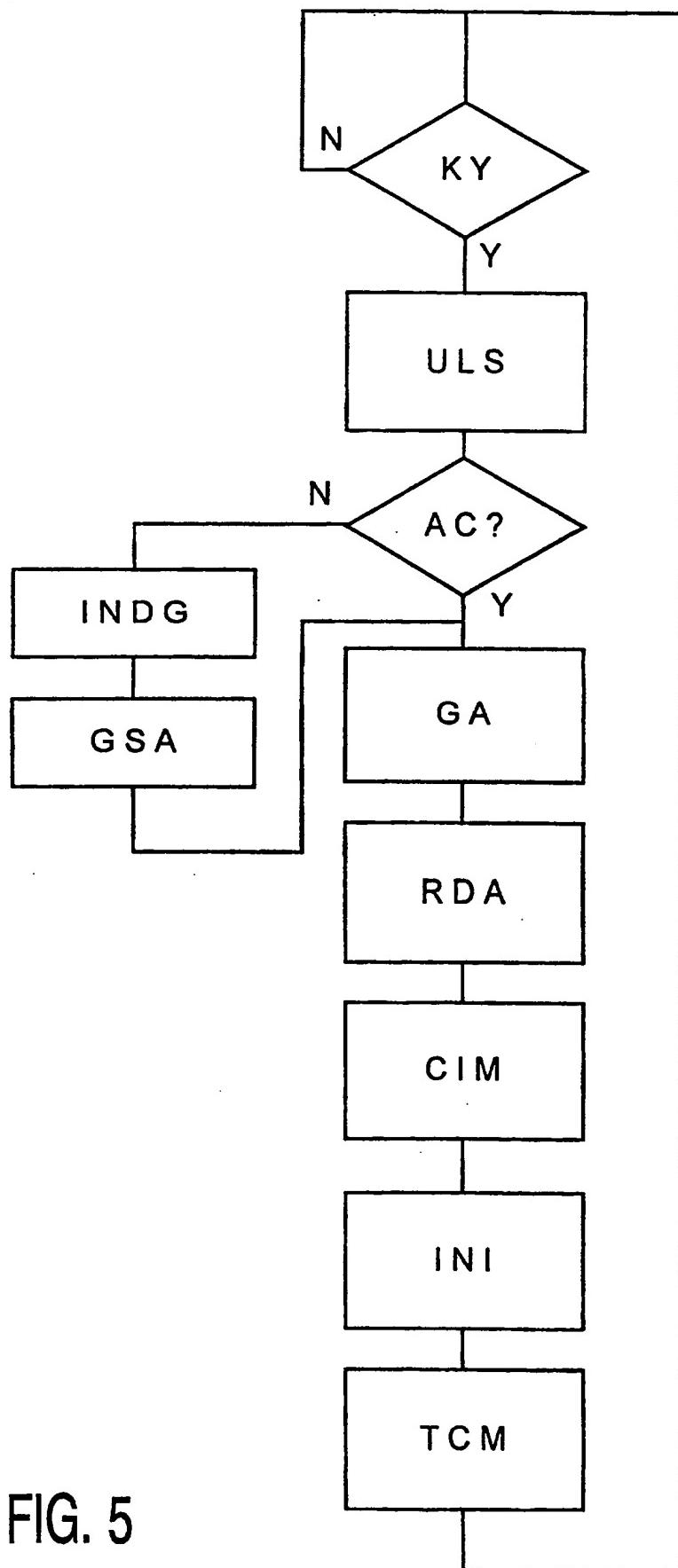


FIG. 5

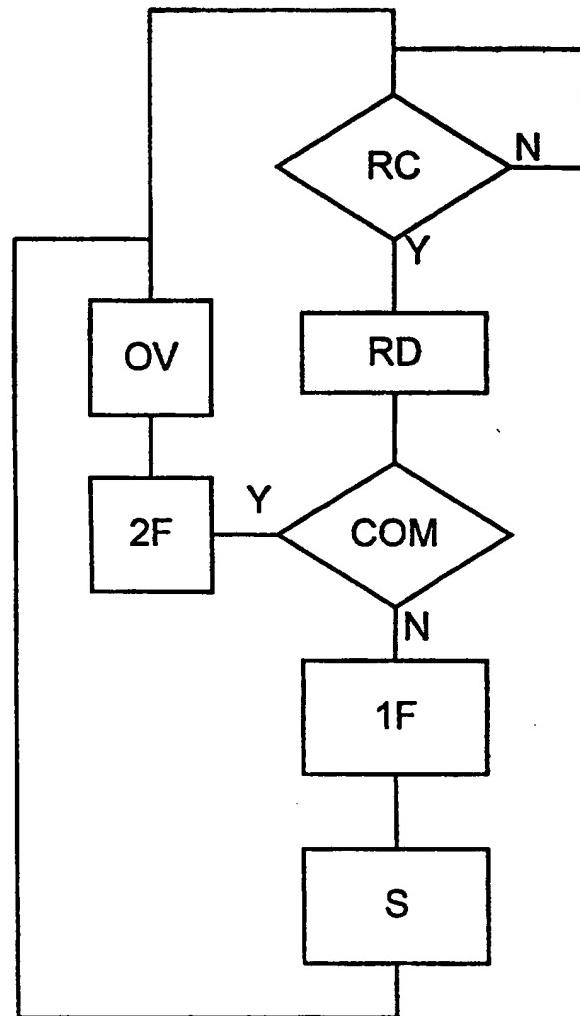


FIG. 6